

WHAT IS CLAIMED IS:

1                    1.     In an environmentally hardened Ethernet network, an apparatus for  
2 conveying data signals comprising:  
3                    a cable for carrying data in a first section and power in a second  
4 section parallel to the first section; and  
5                    end connectors for the cable terminating both the first section and the  
6 second section, the end connectors configured to maintain adequate physical and electrical  
7 contact over a range of operationally harsh environmental conditions, wherein each network  
8 equipment is coupled to receive data and power via said end connectors.

1                    2.     The apparatus according to claim 1 wherein said power section  
2 includes wiring of a gauge to support current sufficient to supply all network equipment from  
3 a central source to each end user in a cabling run.

1                    3.     The apparatus according to claim 2 wherein said data section of said  
2 cable further includes UTP wiring pairs.

1                    4.     The apparatus according to claim 3 wherein said data section of said  
2 cable further includes protective gel sheathing of said UTP pairs.

1                    5.     The apparatus according to claim 4 further including a foil sheathing  
2 around the first section and said second section and a drain wire juxtaposed to said foil  
3 sheathing disposed parallel to said first section and said second section.

1                    6.     The apparatus according to claim 5 further including a suspension line  
2 bound to said cable for stress relief of said cable.

1                    7.     The apparatus according to claim 4 further including a hollow conduit  
2 that permits installation of optical fiber before or after installation of the cable; and a sheath  
3 enclosing said conduit together with said first section and said second section.

1                    8.     The apparatus according to claim 7 wherein said hollow conduit is of a  
2 pliant material having walls of sufficient rigidity to be self supporting without collapsing.

1                    9.     The apparatus according to claim 3 further including:

2 high performance physical layer transceivers at each network equipment, each  
3 being clocked at a substantially lower rate than design specification operational distance  
4 between network elements.

1 10. The apparatus according to claim 9 wherein said transceivers are  
2 configured to operate over said UTP wiring pairs in full duplex switched packet transmission  
3 mode between network elements in order to extend data rate capacity.

1 11. The apparatus according to claim 10 wherein a plurality of UTP pairs  
2 support simultaneous transmission in a common direction.

1 12. The apparatus according to claim 3 further including:  
2 high performance physical layer transceivers at each network equipment  
3 wherein said transceivers are configured to operate over said UTP wiring pairs in full duplex  
4 switched packet transmission mode between network elements in order to extend operational  
5 distance between network elements.

1 13. The apparatus according to claim 1 wherein the end connectors have:  
2 gold plated pins and sockets that make contact with each other over the entire  
3 circumference and length of the pins;  
4 plugs and receptacles that interlock with protective housings that shield  
5 contact areas from dirt, moisture and EMI and further have secured mechanical clasp  
6 mechanisms providing strain relief from torque and stress.

1 14. The apparatus according to claim 13 wherein the end connectors  
2 contain within the contact areas a protective contact dielectric gel.

1 15. A method for providing Ethernet signals in an environmentally harsh  
2 environment comprising:  
3 carrying data in a first section and power in a second section parallel to the  
4 first section of an environmentally hardened cable; and  
5 carrying said data of said cables through end connectors terminating both the  
6 first section and the second section, the end connectors configured to maintain adequate  
7 physical and electrical contact over a range of operationally harsh environmental conditions,  
8 wherein each network equipment is coupled to receive data and power via said end  
9 connectors.

1                   16.     The method according to claim 15 further including  
2                   operating high performance physical layer transceivers at a clock rate  
3                   substantially less than design clock speeds over UTP wiring pairs in full duplex switched  
4                   packet transmission mode between network elements in order to extend operational distance  
5                   between network elements.